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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/213,613	12/18/1998	REEMA GUPTA	19898/5	6656

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EXAMINER

CALDWELL, ANDREW T

ART UNIT	PAPER NUMBER
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2151

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/213,613

Applicant(s)

GUPTA ET AL.

Examiner

Andrew Caldwell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Remarks

Claims 1-9 are pending.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the subject matter of claim 5 and the last four lines of claim 9 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. **The objection to the drawings will not be held in abeyance.**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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1 not commonly owned at the time a later invention was made in order for the examiner to
2 consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)
3 prior art under 35 U.S.C. 103(a).

4
5 Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable
6 over Kedem, U.S. Patent No. 6,725,331, in view of van der Wal, A., "Efficient
7 Interprocessor Communication in a Tightly Coupled Homogenous Multiprocessor
8 System," Proc. of the IEEE Workshop on Future Trends of Distributed Computing
9 Systems, IEEE, pp. 362-368, October 1990, for the reasons given with respect to
10 Kedem, U.S. Patent No. 6,195,761, in the last Office action. The reasons for rejection
11 should be the discussion of other patents to Kedem in past Office actions. Furthermore,
12 this rejection can be easily overcome by invoking the 35 U.S.C. 103(c) exclusion.

13
14 Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kedem
15 '761 in view of van der Wal, as applied to claim 1 above, and further in view of Sato et
16 al., U.S. Patent No. 5,133,071. No reasons for rejection will be given in this Office
17 action since they should be readily apparent from the discussion of Kedem '485 in prior
18 Office actions. The reasons for rejection should be the discussion of other patents to
19 Kedem in past Office actions. Furthermore, this rejection can be easily overcome by
20 invoking the 35 U.S.C. 103(c) exclusion.

21

22

1 Claims 1-3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable
2 over the Symmetrix Model 5500 Product Manual, Rev. G, EMC Corp., pp. 1-236
3 (Symmetrix Product Manual), in view of Litt, U.S. Patent No. 5,815,651, and further in
4 view of of van der Wal, A., "Efficient Interprocessor Communication in a Tightly Coupled
5 Homogenous Multiprocessor System," Proc. of the IEEE Workshop on Future Trends of
6 Distributed Computing Systems, IEEE, pp. 362-368, October 1990.

7
8 Regarding claim 1, the Symmetrix Product Manual teaches the invention
9 substantially as claimed by disclosing a system comprising a shared service processor
10 providing a single point of contact for a user interfacing with at least one line processor
11 (pp. 11 and 21-22, particularly Fig. 3 on p. 22 showing the line processors/channel
12 directors and the service processor). The Symmetrix Product Manual teaches that the
13 service processor communicates with the line processors via a serial interface (p. 21
14 discussion of service processor – service processor communicates with Symmetrix
15 subsystem using RS-232 interface). The fact that the service processor and the
16 Symmetrix subsystem processors communicate implicitly shows that they exchange
17 messages.

18 The Symmetrix Product Manual therefore does not teach a system wherein: (a)
19 the service processor is in electrical communication with shared memory including
20 mailboxes operable to enable communication between the at least one line processor
21 and the service processor; (b) the service processor is operable to selectively deliver
22 commands to a respective mailbox of a selected one of said at least one line processor;

1 (c) the service processor is selectively operable to issue a system management
2 interrupt to any or all of the at least one line processors, the interrupt signaling to the at
3 least one line processor to access a respective mailbox in the shared memory.

4 Litt on the other hand teaches a system in which the a service processor is
5 connected to various controlled processors via a parallel bus as opposed to a serial bus
6 as in the Symmetrix Product Manual (col. 4 lines 20-28).

7 It would have been obvious to one of ordinary skill in the art at the time the
8 invention was made to modify the system of the Symmetrix Product Manual to directly
9 couple the service processor to the line processors using a parallel bus based on Litt's
10 teaching that a parallel data path/bus is an alternative to a serial data bus as in the
11 Symmetrix Product Manual (col. 4 lines 20-28).

12 The combination of the Symmetrix Product Manual in view of Litt does not teach
13 a system wherein: (a) the service processor is in electrical communication with shared
14 memory including mailboxes operable to enable communication between the at least
15 one line processor and the service processor; (b) the service processor is operable to
16 selectively deliver commands to a respective mailbox of a selected one of said at least
17 one line processor; (c) the service processor is selectively operable to issue a system
18 management interrupt to any or all of the at least one line processors, the interrupt
19 signaling to the at least one line processor to access a respective mailbox in the shared
20 memory.

21 van der Wal on the other hand teaches a multiprocessor system in which
22 processors connected on a bus communicate using mailboxes and interrupts (p. 362

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1 second complete paragraph in col. 2). van der Wal therefore teaches a system wherein
2 a processor is in electrical communication with shared memory including mailboxes
3 operable to enable communication between the processors (p. 362 second complete
4 paragraph in col. 2). van der Wal also teaches a system in which one processor is able
5 to selectively deliver messages/commands to a respective mailbox of a selected one of
6 the other processors (p. 362 second complete paragraph in col. 2). van der Wal also
7 the "sending" processor is selectively operable to issue a system management interrupt
8 to any or all of the at least one "receiving" processors, the interrupt signaling to the at
9 least one "receiving" processor to access a respective mailbox in the shared memory (p.
10 362 second complete paragraph in col. 2). van der Wal therefore teaches a mailbox
11 communication scheme but does not teach its use in the particular context of line and
12 service processors.

13 It would have been obvious to one of ordinary skill in the art at the time the
14 invention was made to combine van der Wal's communication scheme using shared
15 memory mailboxes and interrupts with the system of the combination of the Symmetrix
16 Product Manual in view of Litt because a person of ordinary skill in the art would clearly
17 recognize that some interprocessor communication scheme must be selected to
18 implement the system of the combination of the Symmetrix Product Manual in view of
19 Litt. Otherwise, the system could not operate. In this context, of a bus based
20 multiprocessor system as in the combination, a person of ordinary skill in the art would
21 recognize that reducing bus contention caused by polling is an important consideration
22 (van der Wal p. 362 second complete paragraph) and would therefore choose the

1 mailbox scheme using global interrupts described by van der Wal (p. 362 second
2 complete paragraph lines 11-16) because on van der Wal's explicit teaching that *most*
3 multiprocessor systems use some form of this communication scheme.

4 As to claim 2, the combination of the Symmetrix Product Manual in view of Litt
5 and further in view of van der Wal as applied to claim 1 above teaches these features.
6 Official notice is hereby taken of the fact that an acknowledgement to a message is well
7 known in the art. It would have been obvious to one of ordinary skill in the art at the
8 time the invention was made to have the line processor of the combination of the
9 Symmetrix Product Manual in view of Litt and further in view of van der Wal
10 acknowledge a message sent by the service processor because it would eliminate
11 uncertainty as to whether or not the line processor received the message. The
12 combination therefore teaches a system in which the line processor accesses the
13 command delivered to a respective mailbox, interprets the command, and then delivers
14 an appropriate response to a mailbox (p. 362).

15 As to claim 3, the combination of the Symmetrix Product Manual in view of Litt
16 and further in view of van der Wal teaches a system wherein the line processor is
17 operable to assert its system management interrupt line to the service processor after
18 delivering the appropriate response to the mailbox since van der Wal teaches that all
19 processors can communicate with each other (p. 362).

20 As to claims 6-8, they are method claims corresponding to apparatus claims 1-3,
21 respectively. Since they do not teach or define above the information in the
22 corresponding apparatus claims, they are rejected under the same basis.

1

2 Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the
3 Symmetrix Product Manual in view of Litt, and further in view of van der Wal, as applied
4 to claim 1 above, and further in view of Sato et al., U.S. Patent No. 5,133,071.

5

6 Regarding claim 4, the combination of the Symmetrix Product Manual in view of
7 Litt and further in view of van der Wal teaches the invention substantially as claimed.
8 See the rejection of claim 1 above. The combination does not teach the additional
9 feature of claim 4.

10 Sato on the other hand teaches a service processor electrically coupled to a
11 nonvolatile memory/disk drive (Col. 1 lines 17-21). The disk drive stores operating
12 programs for embedded processors/channel controllers. The service processor loads
13 these operating programs into memory when the system powers on (Col. 1 lines 17-26).
14 These operating programs are initialization and/or boot information. Upon considering
15 Sato's teachings, a person of ordinary skill in the art at the time the invention was made
16 would have recognized that Sato's teaching is merely a specific example of the general
17 principle of having a service processor configure a system by loading the executable
18 code for an embedded processor at power up.

19 It would have been obvious to one of ordinary skill in the art at the time the
20 invention was made to combine Sato's teaching with the system of the combination of
21 the Symmetrix Product Manual in view of Litt and further in view of van der Wal by
22 attaching a disk drive to the Symmetrix Product Manual's service processor and then

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1 having the Symmetrix Product Manual's service processor load executable programs
2 from the disk drive into the memories of the host and disk adapter processors at power
3 up. The Symmetrix Product Manual teaches that the service processor configures the
4 components of the storage system (p. 21 downloads the Symmetrix configuration).
5 Based on this teaching, a person of ordinary skill in the art at the time the invention was
6 made would have made the combination because storing the host and disk adapter
7 programs on the service processor's disk drive rather than in ROM co-located with the
8 individual processors would make software upgrades easier.

9 As to the service processor, Sato does not explicitly teach that the service
10 processor boots from its attached disk drive. However, official notice is hereby take of
11 the fact that processors with attached disk drives commonly boot from programs stored
12 on the attached disk. It would therefore have been obvious to one of ordinary skill in the
13 art at the time the invention was made to combine the teaching of which official notice is
14 taken with the system of the combination of the Symmetrix Product Manual in view of
15 Litt and further in view of van der Wal and further in view of Sato by having the
16 nonvolatile memory attached to the service processor store initialization and/or boot
17 information for the service processor. This combination would have been obvious
18 because storing the service processor boot and/or initialization information on the
19 attached disk drive makes upgrades to the service processor software easier.

20

21

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Response to Arguments

As to the objection to the drawings, the Applicants are reminded that red ink often does not show up in faxed submissions. The Examiner fails to see where the word backplane appears on Figure 3. However, even if those words did appear, the proposed drawing correction would not obviate the objection to the drawings. Although there would be support in the drawings for a backplane, nothing in the drawings would suggest the functional limitation of consolidating tasks onto the service processor to reduce the number of accesses to the backplane to which the service processor and the at least one line processor are coupled. 37 C.F.R. 1.83(a) requires all features of the claimed invention to be shown and does not distinguish between functional and structural limitations.

As to the rejection of claims 1-3 and 5-9 as being unpatentable over Kedem, U.S. Patent No. 6,195,761, in view of van der Wal, the rejection has been withdrawn because the Applicants' statement of common ownership is sufficient under 35 U.S.C. 103(c) to exclude Kedem, U.S. Patent No. 6,105,761, as prior art. See the response filed on April 15, 2004 (paper no. 22) at page 9.

As to the rejection of claim 4 as being unpatentable over Kedem, U.S. Patent No. 6,195,761, in view of van der Wal, and further in view of Sato, the rejection has been withdrawn because the Applicants' statement of common ownership is sufficient under 35 U.S.C. 103(c) to exclude Kedem, U.S. Patent No. 6,105,761, as prior art. See the response filed on April 15, 2004 (paper no. 22) at page 9.

1 As to the rejection of claims 1-3 and 5-9 as being unpatentable over the
2 Symmetrix Product Manual in view of Litt, and further in view of van der Wal, the
3 Applicants' remarks filed on April 15, 2004 (paper no. 22) have been fully considered
4 but are not deemed persuasive. The Applicants are arguing in substance the following:
5 (a) The Symmetrix Product Manual fails to teach a service processor communicating
6 with line processors via a serial interface; (b) Litt is irrelevant to the claims because the
7 interconnection between the service processor, shared memory, and line processors
8 may be either serial or parallel; (c) the combination of van der Wal with the Symmetrix
9 Product Manual and Litt relies upon impermissible hindsight; (d) van der Wal teaches
10 away from the claimed invention.

11 As to point (a), the Applicants argue that the Examiner mischaracterized the prior
12 art by saying that the Symmetrix Product Manual teaches a service processor
13 communicating with line processors via a serial interface, as opposed to via an RS-232
14 interface. RS-232 is well known as a standard for serial communications. See Microsoft
15 Press Computer Dictionary, 3rd ed., Microsoft Press p. 415, 1997. The Examiner fails to
16 see how using a generic term (i.e., serial interface) for an RS-232 interface somehow
17 mischaracterizes the invention.

18 As to point (b), the Applicants argue that Litt is irrelevant to the claims because
19 the interconnection between the service processor, shared memory, and line
20 processors may be either serial or parallel. The Examiner chose to modify Symmetrix
21 Product Manual to use a parallel as opposed to a serial bus. Since the Applicants
22 assert that the bus may be serial or parallel, the Examiner fails to see how this

1 argument is relevant since the combination falls within the admitted scope of the claim.
2 In addition, the Examiner would point out that the Applicants' specification only
3 discloses parallel connections between the service processor, shared memory, and the
4 line processors.

5 As to point (c), the Applicants argue that the combination of van der Wal with the
6 Symmetrix Product Manual and Litt relies upon impermissible hindsight. Any judgment
7 on obviousness is in a sense necessarily a reconstruction based upon hindsight
8 reasoning. But so long as it takes into account only knowledge which was within the
9 level of ordinary skill at the time the claimed invention was made, and does not include
10 knowledge gleaned *only* from the applicant's disclosure, such a reconstruction is proper.
11 See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, all
12 assertions of the Examiner made in the rejection have been supported by knowledge
13 gleaned from the references. See the rejection above.

14 As to point (d), the Applicants argue that van der Wal teaches away from the
15 claimed invention because reducing bus contention is an important consideration and
16 van der Wal's mailbox scheme using global interrupts does not reduce bus contention
17 as much as van der Wal's mailbox scheme using distributed interrupts. This argument
18 ignores the fact that a mailbox scheme using global interrupts does reduce bus
19 contention when compared to a mailbox scheme using polling.

20 As to point (e), the Applicants argue that the only reason to combine van der Wal
21 with the Symmetrix Product Manual is to consolidate important backplane bandwidth.
22 This statement is not true since van der Wal teaches that *most* multiprocessor systems

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1 use some form of the mailbox scheme using global interrupts (p. 362 second complete
2 paragraph lines 11-16). This statement is express motivation. The rejection is therefore
3 proper since it does not rely only on knowledge gleaned *only* from the applicant's
4 disclosure.

6 **Conclusion**

7 A shortened statutory period for response to this action is set to expire **three**
8 **months** from the mail date of this letter. Failure to respond within the period for
9 response will result in **ABANDONMENT** of the application (see 35 U.S.C. 133, M.P.E.P.
10 710.02, 710.02(b)).

11
12 Any inquiry concerning this communication or earlier communications from the
13 examiner should be directed to Andrew Caldwell, whose telephone number is (703)
14 306-3036. The examiner can normally be reached on M-F from 9:00 a.m. to 5:30 p.m.
15 EST.

16
17 If attempts to reach the examiner by phone fail, the examiner's supervisor,
18 Glenton Burgess, can be reached at (703) 305-4792. Additionally, the fax numbers for
19 Group 2100 are as follows:

20
21 Fax Responses: (703) 872-9306

22
23 Any inquiry of a general nature or relating to the status of this application should
24 be directed to the Group receptionist at (703) 305-9600.

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27 

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29
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31 Andrew Caldwell
32 703-306-3036
33 June 2, 2004